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WITH WHICH IS INCORPORATED "THE BRANTFORD COURIER"

FORECASTS
ly fair and warm to-day, thunderstorms in a few localities. Thursday—Light to moderate winds, fair and warm.

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TELEPHONE CITY MOURNS DEATH OF PROFESSOR BELL

Passing of Inventor of Telephone Recorded at His Estate Near Baddeck, Nova Scotia—Mrs. Bell With Aged Inventor When End Came—Funeral to be Held in Baddeck, N. S.—Brantford's Claim as the Birthplace of the Great Invention.

SYDNEY, N.S., Aug. 2.—Dr. Alexander Graham Bell, inventor of the telephone, died at 2 o'clock this morning at Beinn Bhreagh, his estate near Baddeck. Dr. Bell's death came suddenly for though he had been somewhat unwell for several months, he had not been confined to his bed. He became seriously ill about five o'clock on Tuesday afternoon and was immediately attended by Dr. Kerr of Washington, D.C., a cousin of Mrs. Bell, who has been visiting at Beinn Bhreagh and by Dr. J. J. Roy of Sydney, who was also there.

His condition grew rapidly worse, however, and death came early in the morning.

WAS WITH HUSBAND

Mrs. Bell was with her husband when death took place as were also one of the daughters, Mrs. Marian Hubbard Fairchild and her husband, David G. Fairchild of Washington. The second daughter is Mrs. Elsie M. Grosvenor, wife of Gilbert H. Grosvenor, editor of The National Geographic Magazine, Washington.

BURIED IN CANADA

Dr. Bell will be buried on the top of Beinn Breagh Mountain at Baddeck in a spot chosen by himself. Cause of death was progressive anaemia.

SHOCK TO FRIENDS

WASHINGTON, Aug. 2.—News of the death of Dr. Alexander Graham Bell at his summer place and laboratories at Baddeck, N.S., came as a shock to the scientist's many friends and associates in Washington, although they knew he had been failing for several months. At a birthday luncheon some months ago Dr. Bell's friends were surprised to see that he had become feeble from age during the last year and that his remarkable vigor was fast disappearing. Officials of the National Geographic Society, in which Dr. Bell was prominent, received word of his death in private advices from Baddeck. Dr. Bell's home here is closed for the summer.

WORDS OF SYMPATHY

(Special to the Expositor)

TORONTO, Aug. 2.—J. A. D. McCurdy, manager of the V. D. L. Rubber Corporation, Ltd., and a life long friend of the late Dr. Bell, expressed himself as extremely sorry to hear of the inventor's death. Mr. McCurdy was born at Baddeck and, as a result, his acquaintance with Dr. Bell was of long duration.

"He was a wonderfully big-hearted man," said Mr. McCurdy, "and was extremely sympathetic. His home life was one of the most beautiful I have ever seen." Speaking of Dr. Bell's many works Mr. McCurdy expressed the opinion that many people hardly realized what Dr. Bell had done for the whole world." He was responsible for lip reading and the sign language," Mr. McCurdy pointed out.

With regard to his work on aeroplanes Mr. McCurdy said Dr. Bell was really responsible for the practical flying machine on this continent. "He was one of the big men of this age," said Mr. McCurdy in conclusion.

* * *

BELL CHIEF'S TRIBUTE

Mr. A. T. Smith, division manager of the Bell Telephone Company at Toronto and a man who has been in telephone work since its inception, said "I personally have been more or less closely connected with Dr. Bell. I assisted in the first long distance telephone from Hamilton to Dundas, and I also was present at the dedication of the Bell Memorial in Brantford. Also I have a photograph of myself along with Dr. Bell which was taken at the place where Dr. Bell said himself that he invented the telephone. As to his character he was a most kindly gentleman, his manners were of the simplest and he was a most entertaining man to meet.

* * *

SUPERINTENDENT'S STATEMENT

Mr. J. H. Martin, superintendent of the Bell Telephone said: "Dr. Bell was a man who gave his life to humanity. Perhaps no one thing plays a better and a more humane part in the average life than the telephone does. It is used throughout the world for social, home and business purposes and it can never be replaced by any other motive of communication. As the inventor of the telephone, Dr. Bell will always be remembered.

* * *

FIRST USER'S TRIBUTE

The man who signed the first contract for a telephone service in Toronto, Henry Winnett, one of the proprietors of the Queen's Hotel, paid tribute to-day to the man who invented the telephone.

"I am very sorry to hear of the death of Mr. Bell," said Mr. Winnett. "He did a great deal for the world by his wonderful inventions. He revolutionized business methods."

"By the way," remarked Mr. Winnett, "it may be interesting to know that the first words said over the telephone, spoken by Dr. Bell to his brother at the other end of the line, were these words of Hamlet: 'To be or not to be.' It had been agreed between Dr. Bell and his brother that these words were to be used."

* * *

MAYOR McGUIRE

At the Board of Control meeting to-day, Mayor McGuire made reference to Dr. Bell's death. "I am sure

(Continued on page 8.)

The History of the Invention

As Written For The Expositor by Professor Bell Himself.

In March, 1916, Prof. Bell, upon the invitation of The Expositor, wrote the following particulars for this paper regarding his invention of the telephone and Brantford's connection with it:

1331 Connecticut Avenue,
Washington, D. C., March 28, 1916.

To the Editor of The Expositor:

In reply to your note of March 22 I take pleasure in forwarding to you a copy of my evidence in the Government Telephone suit, printed in a volume entitled "The Bell Telephone."

This will give you authentic information in great detail concerned the early history of the telephone. As the testimony is very voluminous, forming 469 printed pages, I have made marginal notes directing your attention to the paragraphs relating to Brantford; and have also made an index to the Brantford references. This testimony was given under oath in 1892.

MY CONNECTION WITH BRANTFORD

In 1870 my father, the late Professor A. Melville Bell, purchased the property at Tutela Heights, where he made his home for so many years. This was my home also from August 1870 until October 1872, when I went to Boston, to reside permanently in the United States.

I soon became connected with the Boston University; and for some years made a practice of spending my summer vacations with my parents in Brantford; and also of spending the Christmas holidays there. The summer vacation usually extended from the middle of July to the end of September; and the Christmas vacation lasted for one week.

In Boston I carried on electrical experiments of various kinds; and when the summer vacation came I would carry my apparatus to Brantford and continue my experiments there.

The years 1874 and 1875 are especially associated with the incipiency of the telephone. During this period I resided in Salem, Mass., going in to Boston every day for my professional and experimental work, and spending the summer vacations in Brantford.

BRANTFORD VISIT OF 1874

Researches carried on at Tutela Heights, Brantford, during the summer of 1874, are referred to in detail in the accompanying volume of testimony pp. 29-40. Three of these series are associated with the origination of the telephone:

1. A series of researches relating to multiple telegraphy, whereby a number of telegraph messages could be sent simultaneously along the same line without confusion, by employing musical signals of definite pitch. These researches culminated in the invention at Brantford in 1874 of what is now known as the harp telephone, the ancestor of the speaking telephone.

2. A long series of experiments were made at Tutela Heights, Brantford, during the summer of 1874, with a human ear taken from a dead subject. Upon speaking into the ear the little bones attached to the membrane were seen to be in vibration, and tracings of these vibrations were obtained upon smoked glass, showing the forms of vibration characteristic of the elements of speech.

3. The experiments with the ear suggested converting the harp telephone into a membrane speaking telephone modelled after the human ear by attaching one of the reeds of the harp telephone to a stretched membrane and thus forcing it to copy the movements of the air during the utterance of a sound. This culminated in the invention in Brantford in 1874 of what is now known as "the telephone," but which was then more properly called "the electric-speaking telephone" to distinguish it from previously existing telephones which were not electric or did not speak.

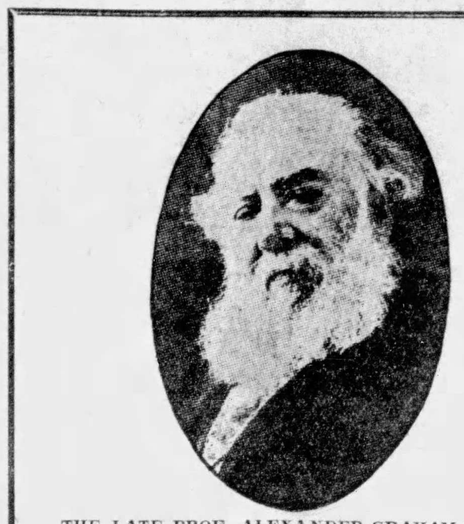
The telephone devised in Brantford in 1874 was made in Boston in June, 1875. Although it was a little difficult at first to follow the articulation of the instrument, the varying pitch of the voice was clearly perceptible and words were occasionally understood. It will thus be seen that the telephone was conceived in Brantford and born in Boston.

Brantford is justified in calling herself "The Telephone City," because the telephone originated there. It was born at 109 Court street, Boston, June 2, 1875, and speech sounds were heard from it very shortly afterward.

The Brantford claims date from 1874, and the Boston claims from 1875.

BRANTFORD VISIT OF 1875

The history of the telephone patent which originated the great



THE LATE PROF. ALEXANDER GRAHAM BELL

telephone industry of to-day is interesting in this connection. I wrote the patent-specification myself, and the first draft was made in Brantford during the visit I paid to my parents in September, 1875.

During this visit also, I invented and made in Brantford, in September, 1875, a liquid spark-arrester to overcome the difficulty I had experienced in working multiple telegraph apparatus on account of the spark that appeared between the contact points of the transmitter when the circuit was broken. This was overcome by bridging the gap with water, and by dipping one of the conducting wires very slightly into the water. The wire was adjustable up and down to regulate the amount of water-resistance introduced when the main circuit was broken.

This invention is chiefly interesting in connection with the telephone from the fact that it suggested the type of apparatus illustrating the variable-resistance clause in the telephone patent which covered the various kinds of carbon transmitters, and all the other forms of telephone operating by means of variable resistance.

After my return to Boston in October, 1875, experiments to improve the articulation of the telephone were carried on, but for various reasons progress was very slow. On March 10, 1876, however, complete sentences were easily understood at my laboratory, No. 5 Exeter Place, Boston.

The first really satisfactory experiments were made with a liquid transmitter operating on the variable resistance plan. But the Brantford membrane-telephone of 1874 was also at this time so much improved that conversation could be carried on by its means in laboratory experiments in which the transmitter and receiver were in different rooms of the same house.

On the twenty-fifth of June, 1876, the telephone was publicly exhibited in Philadelphia at the Centennial Exhibition, and almost immediately attracted the attention of the whole world.

Up to this time it had only been used in laboratory experiments; but on July 7, 9 and 12, 1876, attempts were made in Boston to communicate over real telegraph lines of many miles in length. The transmitting and receiving instruments were in neigboring rooms in the Equitable Building in Boston, and two telegraph wires extending to a distant place were there connected together under the idea that the electrical undulations from the transmitter would go to the distant place by one wire and return to the receiver by the other wire. In this way it was hoped to ascertain what effects would be produced on long lines.

Faint sounds were heard when Rye Beach was looped into the circuit, but the results were inconclusive from the fact that the transmitting and receiving telephones were in the same building, and not quite out of earshot of each other, so that there was some doubt as to whether the sounds perceived might not have come through the air from the one room to the other instead of traversing the electric circuit to Rye Beach and back. There was no doubt however, about the fact that the instruments required improvement to enable them to be successfully operated upon long lines.

A large number of coils of insulated wire of different kinds were then made in Boston. Long coils and short coils, coils with few turns of thick wire, and coils with many turns of fine wire, etc., and in August, 1876, these coils were taken to Brantford and experiments made with them there.

BRANTFORD VISIT OF 1876

The Dominion Telegraph Company of Canada very kindly placed its lines at my disposal for experimental purposes. In August 1876, somewhere about the tenth day of that month, experiments were made between Brantford and Paris, which resulted in the discovery of the proper relation of the parts of a telephone to permit of its use upon a long line.

The battery employed was in Toronto, the transmitting instrument was in Brantford at the office of the Dominion Telegraph Company, and the receiving instrument in the telegraph office at Paris, Ontario.

I had made arrangements with my uncle, the late Prof. David C. Bell, then residing in Brantford, to take charge of the transmitting station, as my father had stated that he would be unable to be present. Persons were to sing, talk, or recite continuously into the transmitting instrument in Brantford while I listened at the receiver in Paris.

After observing the effects for some time I telegraphed to Brantford by another line to ask Mr. Griffin, the manager, I believe, of the telegraph office there, to change the coils in the transmitting instrument, while I made a similar change in the received at Paris.

At first the speech sounds perceived in Paris were feeble and far away; but, by changing the arrangements of the coils a combination was at last arrived at which resulted in loud and clear artciliation in Paris.

I even fancied that I could recognize the speakers by their voices, and telegraphed back to Brantford to ascertain whether one of the speakers was not my father The reply came back that he was present and had been reciting for some time into the transmitter.

This Brantford experiment is of historical interest. First: Because it led to the discovery of the proper combination of parts in a telephone to enable it to become operative upon a long line; and because upon this occasion occurred the first transmission of the human voice over a telegraph line in which the transmitting and receiving telephones were miles apart.

Unfortunately the transmitting and receiving instruments were of different construction. One was a transmitter pure and simple, and the other a receiver, not adapted for use as a transmitter also. Thus, upon this occasion, reciprocal communication could not be carried on, and no conversation was held through the wire. The voice was transmitted from Brantford and heard in Paris; but all communication from Paris to Brantford had to be carried on by telegraph through another line.

Within a few days of the tenth of August, 1876, another noteporthy experiment was made on a wire leading from Brantford to Mount Pleasant.

As a preliminary to a proposed public demonstration of the telephone to be given at my father's house on Tutela Heights, I proceeded to Mount Pleasant and satisfied myself by actual experiment that the Mount Pleasant line could be used for the purpose.

The only trouble was that the Mount Pleasant line, at its nearest point, was a considerable distance away from my father's house, probably a quarter of a mile or more. In order to overcome this difficulty the rather daring experiment was tried of connecting my father's house at Tuela Heights with the nearest telegraph pole on the Mount Pleasant road by means of ordinary stove-pipe wire

(Continued on Page 15).

THE PASSING OF A GREAT MAN

(Editorial)

In 1870 there arrived in Brantford a young man, in such poor health that the bracing Canadian climate was considered the last chance for his escape from the fate of two elder brothers. His name was Alexander Graham Bell, now known the world around as the diserer of one of the greatest of modern inventions—the telephone.

HEIR TO VOICE EXPERIMENTS

The father, Prof. Melville Bell, a Scotchman, was himself a man of very great prominence, and universally accredited as "the foremost of all teachers of speech science, and the use of the voice." It was he who made the great discovery of "visible speech," and he was a University lecturer in London at the time he decided to abandon his highly important sphere of work in the Old Land and bring his son to the Dominion. The grandfather, Alexander Bell, was also an eminent elocutionist, and corrector of defective speech, so that young Graham Bell was the heir to long years of research which led to the great and final achievement in his own case. Melville Bell came to Brantford, owing to the proximity of an old friend, and the young inventor when he arived here in his twenty-fourth year, is described as having been "a tall young man, with large, dark, intellectual eyes, pensive countenance, and magnetic personality."

WHERE THOUGHTS OF PHONE ORIGINATED

From Mr. Robert Morton was purchased the home on Tutela Heights, now civic property. Here in a hammock swung between two trees, at the edge of the Grand River bank, young Bell used to rest and woo back his strength, as he viewed the glorious vista stretching across the valley between the Heights and Brantford, while his mind was busy with the thoughts and plans which were ultimately to find such splendid fruition. Later on, as strength returned, he mingled with the town and country folk, and became very popular, albeit he was regarded as the possessor of eccentric notions. All sorts of rumors were circulated as to strange experiments in the house and the culmination came when he was seen tacking stove pipe wires along township fences in order to talk through them. Finally there were the semi-public experiments in which many citizens participated: successful talking between Brantford and Mt Pleasant and finally between Brantford and Paris.

THE BOSTON CLAIM

During the progress of the invention Mr. Bell was part of the time in Boston, where he was a teacher in a school for deaf mutes, spending his long summer vacation under the parental roof. He was busy upon his invention in both places, and herein has arisen the claim of our neighbors that the phone originated in the United States. That Boston had a share in much experimental work is unquestioned but that the actual origin of the phone was here, and the first transmission of speech for any distance also here we have it on the emphatic testimony not alone of Mr. Bell himself, but also of the father. The evidence in this regard is most conclusive, ranging from the sworn testimony of Graham Bell when his patents were attacked in a suit in the U. S. courts, to his presence here on October 24, 1917, when the beautiful memorial was unveiled by the Duke of Devonshire, then Governor-General. The quotations of a few of the many testimonies will suffice.

BRANTFORD BIRTHPLACE OF PHONE

"I now confidently feel that my sojourn in Brantford will outlive my existence, because under yon roof of mine the telephone was born."—Extract from speech made by Prof. Melville Bell at a farewell banquet tendered him in 1881 at the Kerby House when he left here to live in Boston:

"Gentlemen, the telephone problem was solved, and it was solved at my father's home." Extract from speech of Dr. Graham Bell at Kerby House banquet 1906, when the inventor was a guest of the Board of Trade.

"Much of the experimental work of the development of the apparatus was done in Boston, still, I am glad to be able to come forward and say that the telephone was invented here."—Graham Bell at memorial unveiling, 1917.

"The patent (telephone) was not written by the Patent office solicitor, it was written by me. The specification was written by me and the first draft of that specification was made in Brantford in September, 1875, and it is that same application that afterwards became the patent upon which the telephone industry is based"—Graham Bell at unveiling 1917.

"The first time that instruments were placed miles apart—Brantford to Paris— and speech successfully transmitted from one place to the other was here in Brantford in August 1876"—Graham Bell at unveiling 1917.

"I wish to say on behalf of the Bell Telephone Memorial Association I have great pleasure in presenting to His Excellency a silver telephone and I hope that in using it he will remember that the telephone originated in Brantford and that the first transmission to a distance was made here, between Brantford and Paris"—Graham Bell at conclusion of memorial address when he handed a silver phone to the Duke of Devonshire.

The fact is thus fully proven that Boston had only an incidental and not a fundamental share in the evolvement of this world-important discovery.

THE BELL MEMORIAL

To Mr. W. F. Cockshutt, ex-M.P. belongs the credit of the erection of a memorial. He was president of the Board of Trade at the time and his proposal was received with immediate approval. There was much organization work effectively looked after by Mr. George Hately as secretary of "The Bell Memorial Association," an organization under the distinguished patronage of H. R. H. the Prince of Wales (now His Majesty King George V.) and having this board of directors: W. F. Cockshutt, president; Lloyd Harris, vice-president; John Muir, treasurer N. Andrews, E. L. Goold, Geo. Kippax, G. H. Muirhead, T. H. Preston, F. D. Reville, A. J. Wilkes, C. H. Waterous and the Mayor and Warden for time being during the quite lengthy period which elapsed before the undertaking was completed.

The subscription list met with a handsome response from the Dominion and Provincial Governments, prominent men in Canada, the United States and England, the City of Brantford, County of Brant and many private citizens. In all the sum of $65,000 was raised, and this amount also permitted of the purchase of the historic homestead.

A SPLENDID DESIGN

As the result of public competition, participated in by many well-known sculptors, the award fell to Mr. Allward of Toronto. The symbolism conveyed by Mr. Allward with consummate skill, is the obliteration of space. Separated by a distance of several feet two large figures in bronze, on granite bases, are depicted the one in the attitude of sending and the other in the attitude of receiving a message. Back of a flight of stone steps is an exceptionally large bronze casting upon which there is outlined in heroic size, the reclining figure of a man in an attitude of deep thought. Over him there hovers another figure—Inspiration—with gracefully uplifted arm pointing to three shadowy figures speeding through the air—the messengers of Knowledge, Joy and Sorrow. Thus, by a stroke of true genius, the sculptor without even the slightest suggestion of the mechanical part of the telephone, has with great subtlety and skill conveyed the story of the annihilation of distance by this modern Mercury.

The memorial grounds abutting on Wellington, Nelson, King and West streets, when first purchased by the directors were covered with buildings, mostly frame, and with their removal and subsequent laying out of the site, Brantford possesses one of the most notable beauty spots in all of Ontario.

AN INGENIOUS TOY

After he was sure that he had solved the problem Mr. Bell endeavored to interest Brantford capital but without result. Citizens of that day regarded the thing as without business possibilities. Then he heard that Mr. George Stephen (later Lord Mount Stephen) president of the Bank of Montreal, was the guest of honor at a luncheon given him by the prominent business men of Hamilton. He accordingly journeyed to the Ambitious City and sent in a note to the chairman asking that he be allowed to show a model of the invention when the dining had been concluded. Then he waited around until admitted Lord Mount Stephen in sending a subscription to the memorial fund in 1909 said in an accompanying letter:—

"Mr. Bell showed us his model which all agreed was a very "ingenious toy." Our foresight, as is always the case, was not equal to our hindsight. That is over thirty years ago, but I remember it as if it had been yesterday."

MANY OTHER ACTIVITIES

Graham Bell was not alone the inventor of the telephone but also the progenitor of many other discoveries, any one of which would have brought him fame. On the occasion of one of his later year visits to Brantford he was in conversation with a number of friends after a luncheon when one of them remarked "I suppose you are all the time thinking out improvements to the telephone?"

Dr. Bell laughingly replied, "I always put any invention out of my mind when the substantial basis is completed. This was the case with the telephone which I sometimes regard as a nuisance in my own home. The modern phone is the product of many minds." At the same time he incidentally remarked that he had taken out some forty patents for various things. On the same occasion—it was at Mr. Frank Cockshutt's summer residence overlooking the Grand River valley—a thunderstorm came up and Dr. Bell, watching the play of lightning said "What a waste of electric energy. The time is coming when we are going to bottle all of such for future use."

LATER YEAR ACTIVITIES

Dr. Bell's laboratories have been located since 1886 near Baddeck, Cape Breton. There for many years he has conducted research work and experiments in aerial locomotion and other scientific subjects and maintained his private museum showing the development of his greatest inventions. He encouraged Samuel P. Langley to invent the first flying machine and declared after witnessing its flight at Quantico, Va., in 1896, that the age of the airplane was at hand, although Langley's machine was destroyed.

Dr. Bell formed in 1907 the Aerial Experimen. Association with headquarters in Cape Breton and its object to learn to fly. It is claimed that it was with machines developed by that association that the first really successful public flights of airplanes in America were made.

In the world war, Dr. Bell and F. W. Baldwin invented a boat called a hydrodrome which developed a speed of 70 miles an hour and was called the fastest in the world. It used an airplane propeller and carried beneath it a series of planes which lifted its main body above the water as its speed increased. It was intended for submarine chasing and scouting but the armistice prevented its use for those purposes.

LOVED TO VISIT BRANTFORD

Dr. Bell loved to revisit Brantford, the scene of his most notable achievement and of many fond memories. On such occasions he charmed all by his simplicity of manner and boyish enthusiasm. He had not a vestige of the ostentation or aloofness sometimes associated with world achievement. Very dear to his heart was the fact that during his lifetime, and in his presence, such a handsome memorial should be erected to him and his greatest triumph within the confines of "The Telephone City." He so expressed himself to more than one at the unveiling ceremonies, and his heart was manifestly full to overflowing upon that occasion. He and his wife and family still possess many warm friends here—friends not alone proud of the fame which he achieved for himself and incidentally this community, but also of the fact that they had some share in the life of this most noble-minded and unaffected genius.

A SUGGESTION

It is suggested that Brantford's flags should be placed at half mast on the day of the funeral, that a suitable resolution of regret be passed by the City Council at a special meeting, and that at the hour of interment, Mr W. F. Cockshutt, as president of the Bell Memorial Association be asked to place a wreath at the foot of the memorial in conjunction with the Mayor and Council, members of the "Bell Memorial Association" and citizens generally.

Telephone City Mourns Death of Prof. Bell

(Continued from page 1)

tacked along the fence by the side of the road. The experiment met with success and speakers in Brantford were heard quite distinctly at Tutela Heights.

A public exhibition of the telephone was then given at Tutela Heights, which was witnessed by a large number of the citizens of Brantford. This was the first public exhibition of the telephone in which the speakers were in one place and the listeners in another place miles away.

Another point demonstrated upon this occasion for the first time, was the fact that the voices of a number of persons could be transmitted simultaneously along the same line and be clearly perceived at the other end. The transmitting instrument in Brantford was provided with a triple mouthpiece, made in Brantford, which permitted three persons to sing into the instrument at the same time; and the three voices, joining in a part song, were clearly perceived at Tutela Heights.

This public exhibition received considerable notice in the Canadian newspapers, and I have no doubt that The Brantford Expositor of the time (about the second week of August, 1876) contained an account of it. The Scientific American of New York, published on September 9, 1876, a long article concerning these Brantford experiments, under the heading, "The Human Voice Transmitted by Telegraph."

After returning to Boston in the autumn of 1876 no difficulty was experienced with the knowledge gained from the Brantford experiments in obtaining reciprocal communication on the same line by instruments of identical construction that could be used both as transmitters and receivers.

The first actual conversation carried on by telephone in which the speakers were miles apart, occurred in Boston, October 9, 1876, on a line belonging to the Walworth Manufacturing Company, and extending from Boston to Cambridgeport, Mass, a distance of about two miles.

On November 26, 1876, conversation was carried on between Boston and Salem, Mass., about 18 miles, over the lines of the Eastern Railroad Company.

On December 3, 1876, the first real long-distance conversation took place between Boston and North Conway, N.H., a distance of about 143 miles.

I was in Boston and my assistant, Mr. Thomas A. Watson, in North Conway, and we took the opportunity of still further improving the arrangement of the parts for long-distance work. We also succeeded in talking over this distance with magneto electric telephones, without any battery on the circuit at all. These experiments led us to adopt the magneto-electric form in preference to telephones employing a voltaic battery in our further experiments. We thus came back to the original type of telephone invented in Brantford in the summer of 1874, which was intended to be operated without a battery.

On February 12, 1877, I gave a lecture on the telephone before the Essex Institute in Salem, Mass., illustrated by actual conversation between Boston and Salem. An account of this lecture was transmitted by telephone from Salem to Boston, and published in The Boston Globe the next morning. This was the first newspaper dispatch ever sent by telephone.

In all the long-distance communication referred to, ordinary telegraph lines were employed; but on the fourth of April, 1877, a special telephone line was opened, extending from the workshop of Mr. Charles Williams, Jun., 109 Court street, Boston, to his residence in Somerville, Mass. This was the first telephone line.

CONCLUSION.

In the above remarks relating to the history of the telephone, I have endeavored to show what developments were made in Brantford, and what in Boston; but it is a little difficult for me to discriminate between the two places, as both were closely associated with the early history of the telephone.

Speaking generally, I may say that Boston was the centre of the experimental work of development, and Brantford the centre of development by theoretical reasoning. I spent my summer vacations in Brantford, and, not having any professional work there to distract my attention, I had leisure to ponder over the experiments that had been made in Boston and Salem, and plan out new lines of research.

In this way Brantford became my thinking place. Here the telephone was invented; the first draft of the patent-specification prepared; the proper relation of the parts of a telephone to enable it to be used on long lines, worked out; and the first transmission of the human voice over miles of telegraph line actually accomplished. Here also the first public demonstration of this result was given to the world.

I think, therefore, that Brantford is fully justified in considering itself as integrally associated with the development of the telephone, and I need hardly say that I am deeply grateful to Brantford for seeking to perpetuate this association by the magnificent memorial you are now establishing in your city.

Yours sincerely,

(Signed) ALEXANDER GRAHAM BELL.

SYNOPSIS OF THE PRINCIPAL EVENTS REFERRED TO IN THE FOREGOING LETTER

The invention of the Telephone at Tutela Heights, Brantford, 1874, (summer).

First telephone constructed and speech sounds heard, Boston, June, 1875.

First draft of the telephone patent-specification prepared, Brantford, September, 1875.

Complete sentences first clearly understood by telephone, Boston, March 10, 1876.

The telephone exhibited at the Centennial Exhibition, Philadelphia, June 25, 1876.

First attempts to transmit speech over telegraph lines, Boston, July 7, 9 and 12, 1876.

First successful attempt to transmit speech over a telegraph line, Brantford, August (10?) 1876.

First public demonstration of ability to speak over a telegraph line, Brantford, August, 1876.

First transmission of a number of voices simultaneously over a telegraph line, Brantford, August, 1876.

First conversation by telephone over a telegraph line (reciprocal communication), Boston, October 9, 1876.

First long-distance conversation over a telegraph line (143 miles), Boston, December 3, 1876.

First newspaper dispatch sent by telephone, Salem, February 12, 1877.

First telephone line opened, Boston, April 4, 1877.